

SECTION 2

CHEMICAL HYGIENE PLAN

I. INTRODUCTION

- A. The United States Department of Agriculture, Agricultural Research Service, and the Stuttgart/Pine Bluff Location (**SPBL**), which consists of the Aquaculture Systems Research Unit (ASRU, 1500 Oliver Road, Pine Bluff, AR 71601), the Dale Bumpers National Rice Research Center (DB NRRC, P.O. Box 1090, Stuttgart, AR 72160), and the Harry K. Dupree Stuttgart National Aquaculture Research Center (HKD SNARC, P.O. Box 1050, Stuttgart, AR 72160) are committed to the ideals of protecting **SPBL** employees from health hazards associated with the use of chemicals in our laboratories.
- B. The general intent of this Chemical Hygiene Plan is to:
 - 1. Comply with the various local, state, and federal regulations governing safe laboratory practices. Chief among these is the Chemical Hygiene Standard found in 29 Code of Federal Regulations (CFR) 1450, *Occupational Exposure to Hazardous Chemicals in the Laboratory*. This can be found at the DB NRRC library (the central resource library for the **SPBL**).
 - 2. Assure that **SPBL** employees are not exposed to chemical substances in excess of the permissible exposure limits as defined by OSHA in 29 CFR 1910 Subpart Z.
- C. **Yulin Jia** is the Chemical Hygiene Officer for the **SPBL**.
- D. The plan will be available at each site library for employee review.
- E. This plan will be reviewed annually by the **SPBL** Chemical Hygiene Sub-Committee and updated as necessary.

II. REFERENCES

- A. 29 CFR 1450, a copy of which is available at the DB NRRC library.
- B. 29 CFR 1910 Subpart Z, a copy of which is available at the DB NRRC library.
- C. OSHA Publication 3112, Air Contaminants - Permissible Exposure Limits, 1989 (reprint), a copy of which is available at the DB NRRC library (or see Tables Z1, Z2, and Z3 at <http://www.osha-slc.gov/SLTC/pel/index.html>).

III. DEFINITIONS - For the purpose of this plan, the following definitions will apply:

- A. Action Level: An airborne concentration of a contaminant regulated in 29 CFR 1910 which triggers certain actions such as air exposure monitoring, medical surveillance, etc. Usually one-half of the permissible exposure limit.
- B. Permissible Exposure Limit (PEL): Allowable eight-hour airborne concentrations of contaminants found in OSHA Publication 3112, *Air Contaminants - Permissible Exposure Limits*, 1989 (reprint).
- C. Select Carcinogen: A substance which is regulated by OSHA as a carcinogen, listed as a known carcinogen in the latest Annual Report on Carcinogens published by the National Toxicology Program (NTP), listed under Group 1 ("carcinogenic to humans") by the latest edition of the International Agency for Research on Cancer Monographs (IARC), or listed in either Group 2A or 2B by IARC or under the category "reasonably anticipated to be carcinogens" by NTP.
- D. Time Weighted Average, 8-hour (TWA): The average concentration of an airborne contaminant to which an employee has been exposed over an eight-hour day. In general, $TWA = (C_1T_1 + C_2T_2 + \dots + C_nT_n)/8$, where C is a constant concentration; T is the time, in hours, over which C is constant; and $T_1 + T_2 + \dots + T_n = 8$ hours. Contact the Area Safety and Health Manager if chemical-related work is scheduled to last longer than 8 hours in a given day.

IV. RESPONSIBILITIES

- A. The Location Coordinator:
Current LC for Stuttgart is Don Freeman
 - 1. Approves, by signature, this plan.
 - 2. Authorizes and supports the implementation of this plan, the annual review of this plan, and amendments or changes to this plan.
 - 3. Provides resources for training, equipment, and other support called for in the program.
- B. The Location Administrative Officer (LAO):
Current LAO is Jeanie Gwathney (Acting)
 - 1. Maintains files and records of program activities.
 - 2. Maintains this plan.
 - 3. Publicizes this plan.
- C. The Chemical Hygiene Officer (CHO) acts in consultation with **SPBL** management:
Current CHO is Yulin Jia.
 - 1. Identifies and assesses potential chemical hazards and develops effective

control measures for those hazards.

2. Oversees the Chemical Hygiene Program.
3. Serves as a source of advice and counsel to all employees at the **SPBL** in the area of chemical safety.
4. Provides or arranges appropriate training to employees regarding chemical hazards, safety controls, and emergency procedures at the **SPBL**.
5. In consultation with the Southern Plains Area Safety & Health Manager, reviews this plan annually and monitors its effectiveness.

D. Research Leaders, lead scientists, and department heads will:

1. Assist the CHO in developing pertinent laboratory safety Standard Operating Procedures.
2. Ensure employees comply with provisions of this plan.
3. Perform experiments or operations involving chemical agents in accordance with good laboratory practice, and ensure that technical support personnel perform within those same guidelines.
4. Ensure proper labeling, storage, use, transfer, and disposal of chemical agents.
5. Ensure proper signage in laboratories or other areas where potentially hazardous chemical agents are being studied or are in use.
6. Ensure that personnel wear appropriate personal protective equipment.
7. Ensure that technical support personnel have received proper training prior to initiating operations involving potentially hazardous chemical agents.
8. Correct work errors or conditions that may result in the release of chemical agents.
9. Notify the CHO or CDSO and maintenance personnel when equipment or facilities critical to chemical safety are inadequate or are not performing according to specification.

E. Chemical Hygiene Sub-Committee: These duties performed by the safety committee.

1. The committee shall review the Chemical Hygiene Plan annually, to review new experiments or processes at the **SPBL** involving hazardous chemicals, and to handle other issues involving hazardous chemicals at the **SPBL**.

F. Employees will:

1. Comply with safety regulations and the Chemical Hygiene Plan.
2. All employees are responsible for reading and understanding the MSDS sheets for the chemicals in their work area.
3. Develop good chemical hygiene practices.
4. Suggest improvements.
5. Bring safety concerns to the attention of the supervisor, CHO, or CDSO.
6. Report violations of safety regulations to the supervisor, CHO, or CDSO. Violations may endanger the violators and the others in their vicinity, and may destroy the facility if a fire or explosion should occur.
7. Use personal protective equipment when required.

V. CHEMICAL INVENTORY

- A. A chemical inventory will be maintained on a database by the CDSO. It is the responsibility of all RLs to make sure this database is updated annually. The inventory is to contain, at minimum, Chemical Name(s), Quantity, Grades, Packing Group, Hazards, and Location. The CDSO is required to keep the inventory on record for a minimum of two years.
- B. Separate inventories that list hazardous chemicals as defined by SARA Title III and/or CERCLA will be maintained by the CDSO. Appendix 2.1 has a list of chemicals meeting/exceeding the threshold of SARA Title III/CERCLA requirements. Appendix 2.2 has a list of chemicals below the threshold of SARA Title III/CERCLA requirements.
 1. These separate inventories will be updated as new chemicals are purchased. A report will be forwarded to the CDSO when new\more chemicals are added to the list.
 2. Appendix 2.3 contains a list of extremely hazardous substances and their threshold planning quantities as defined by SARA Title III (40 CFR 355).
 3. Appendix 2.4 contains a list of extremely hazardous substances and their threshold planning quantities as defined by CERCLA (40 CFR 302).
- C. The Hazardous Waste chemical inventory will be updated monthly and upon generation of waste chemicals. Refer to Hazardous Waste Management Plan for

instructions and forms.

VI. MATERIAL SAFETY DATA SHEETS (MSDS)

- A. An MSDS Binder for all lab and shop chemicals (including hazardous chemicals) is maintained.
 - 1. The MSDS sheets are kept in alphabetical order in a clearly marked binder.
 - 2. Location of MSDS Binders:
 - a. Each lab\area will have a clearly marked binder containing all MSDS sheets for all chemicals in that lab\area.
 - b. Each site will keep a Master MSDS Binder containing all MSDS sheets for all chemicals located on the site. These will be kept in a public area for all employees to access at any time. The location for the masters is in the library for DBNRRC and SNARC. The location for the master at ASRU is in the main office of the SJ Parker building.
 - c. The MSDS sheets will also be maintained online with the chemical inventory database at DB NRRC and SNARC.
- B. The RLs are responsible for keeping the MSDS sheets current in their area and in the master binders.
 - 1. A letter of request or e-mail will be sent to the chemical manufacturer for any MSDS sheets that are missing.
 - 2. Attempts to obtain missing MSDS sheets will be documented and kept on file by each site.
 - a. A copy of the request letter will be retained until the MSDS sheets are received.
 - b. Any letters from the manufacturer are to be retained (e.g., letter stating “Per guidelines of the Federal Occupation Safety and Health Act (OSHA) Hazard Communication Standard 29 CFR 1910.1200 and individual state Right-to-Know laws, the products are not considered to be hazardous; and therefore, MSDS sheets are not required”).
 - 3. If an MSDS is not obtainable then the chemical will be disposed of.
- C. The MSDS sheets should be complete and received either prior to, or at the time of receipt of the chemical. It may be necessary to discontinue procurements from vendors that fail to supply MSDS sheets in a timely manner. The MSDS sheet has to have the following information:

1. The identity used on the label (the chemical and common name(s)).
 2. Physical and chemical characteristics of the chemical (such as vapor pressure, flash points).
 3. The physical hazards of the chemical.
 4. The health hazards of the chemical.
 5. The primary route(s) of entry.
 6. The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the manufacturer.
 7. Whether the chemical is listed in the NTP, IARC, or OSHA.
 8. Precautions for safe handling and use.
 9. Recommended engineering controls.
 10. Emergency and first aid procedures.
 11. Date of preparation.
 12. Name, address, and telephone number of the chemical manufacturer.
 13. Toxic Chemical Notification. If the MSDS sheet has been prepared for a SARA Title III Section 313 toxic chemical or a mixture that contains a toxic chemical, a notification about that toxic chemical must be attached to or incorporated into the MSDS sheet. The notification must include a written statement that the product contains the toxic chemical, its name and CAS number and its weight percent.
- D. MSDS will be available, and easily accessible to all employees.
- E. The RLs are responsible for ordering MSDS sheets and updating the binders in their areas and in the Master MSDS Binders.
- F. No chemical will be kept in the units that does not have an MSDS sheet available.

VII. LABELS & OTHER FORMS OF WARNING: Labels are furnished in all labs. All employees will use the labeling system as follows:

- A. Common Name.
- B. Chemical Name.
- C. Percentages of components.

- D. The appropriate hazard warnings.
- E. The name of manufacturer, vendor, or responsible party.
- F. If an original label has become unreadable, the chemical will be disposed of.

VIII. STORAGE & HANDLING OF CHEMICALS

- A. All chemicals will be stored as recommended by the manufacturer.
- B. Storage of chemicals is per their chemical properties.
- C. Chemicals will be stored in their proper chemical storage cabinets or shelves.
- D. Secondary spill containment trays will be used on shelves and in cabinets.
- E. No chemicals will be kept beyond their expiration date.

IX. ENVIRONMENTAL MONITORING

- A. Environmental monitoring is performed to ensure that an employee's exposure to hazardous chemicals does not exceed the permissible exposure limits (PEL) as specified in:
 - 1. 29 CFR part 1910, subpart Z.
 - 2. The manufacturers MSDS sheet will contain the PEL and whether monitoring is recommended.
- B. The CHO, with the help of each RL and the CDSO, will determine whether monitoring is necessary based on:
 - 1. The chemical and its properties.
 - 2. The frequency of chemical use and potential routes of exposure.
 - 3. The personal protective equipment worn while using the chemical.
 - 4. The CHO will provide a written report to the RL (copy to the CDSO) if monitoring is deemed necessary.
 - 5. In consultation with the CHO and CDSO, the RL will determine whether the location has expertise/equipment to conduct monitoring or if a contract with a vendor needs to be established.
 - 6. The environmental monitoring is to be performed in accordance with OSHA rules and regulations. The PELs are not to exceed those specified in 29 CFR part 1910, subpart Z.
 - 7. The RL will notify the employee within 15 working days after the receipt of any monitoring results. The notification can be written or posted in an

appropriate location that is accessible to employees.

X. PROGRAM ELEMENTS

- A. The primary goal of the chemical hygiene program is to reduce employee exposure to chemical contamination. This can be most easily accomplished by controlling the route of entry of chemical agents to humans:
1. Inhalation of chemical vapors, dusts, fumes, or mists is the most dangerous route of entry for chemical contamination. It can be prevented by good laboratory practices, substituting less volatile materials for more volatile materials, separation of humans from chemical processes, ventilation, and personal protective equipment.
 2. *Ingestion* of potentially harmful chemical agents can be prevented by good laboratory practices, with special emphasis on keeping food and drink out of the laboratories and prohibiting mouth pipetting.
 3. *Absorption* through the skin of potentially harmful chemical agents can be prevented by wearing personal protective equipment, separation of humans from chemical processes, and the use of safety showers and eye wash stations.
 4. *Injection* of potentially harmful chemical agents can be prevented by the use of good laboratory practices and by sharps control. The CHO is the point of contact for employees desiring further information.
- B. Methods of Controlling Chemical Exposure

When designing experiments or procedures that involve chemicals, the supervisor shall control employee exposure to chemical agents by the following methods, in order:

1. ENGINEERING CONTROLS: Design facilities, equipment, or processes to reduce exposure; provide exhaust ventilation or isolation of processes producing dusts, mists, or fumes; substitute of less hazardous agents for more hazardous agents, etc.
2. PERSONAL PROTECTIVE EQUIPMENT: Specify the types of protective equipment to be worn by potentially exposed employees to protect them from hazardous chemicals or environments.
3. ADMINISTRATIVE CONTROLS: Institute changes to job administration when engineering controls and personal protective equipment are not feasible. Administrative controls are considered controls of last resort. Examples:
 - a. Arranging work schedules to limit employee exposure to chemicals.
 - b. Transferring employees who have reached their permissible

exposure to chemicals to an environment where no further exposure will be experienced.

C. Engineering Controls

1. Laboratory Fume Hoods: The design, location, and functional requirements of fume hoods are governed by ARS Manual 242.1, *Construction Project Design Standard* and ARS Manual 230.0, *Safety, Health, and Environmental Management Program*.
 - a. The following operations shall be performed in laboratory fume hoods:
 - ◆ Silanizing
 - ◆ Transfer of volatiles or solvents
 - ◆ Reactions in which heat, pressure, or fumes are developed in potentially dangerous quantities
 - ◆ Electrophoresis staining and destaining
 - ◆ Tissue fixation using paraformaldehyde, glutaraldehyde, OsO₄, or epoxy resins
 - ◆ Tissue embedment in epoxy resin
 - ◆ Thin layer chromatography
 - ◆ Grinding and extracting of aflatoxin
 - ◆ Glutaraldehyde mixing
 - ◆ Radioisotope operations:
 - * Iodination
 - * Transferring contents of scintillation vials into other containers
 - * Operations involving volatiles with radioisotopes
 - ◆ Processes involving the use of open flame
 - ◆ Weighing toxic substances
 - b. Laboratory doors shall be kept shut to allow optimum performance of laboratory fume hoods.
 - c. Fume hoods will be inspected at least annually by the area Safety Officer, or other qualified person, and inspection stickers on each hood will reflect this. Adequacy of face velocity will be determined by velocity meters (such as hot wire anemometers), and the laminar nature of air flow will be verified with smoke. Reports of hood inspections are filed at each site for employee review.
2. Biological Safety Cabinets will be used for the following experiments:
 - a. ASRU does not currently use biological safety cabinets. At DB NRRC and SNARC, biosafety cabinets are used for: 1) manipulation of bacteria, fungi, and viruses, in particular those containing recombinant DNA molecules or are plant pathogenic

2) plant tissue culture manipulations, and 3) preparing specialized growth media for microorganisms or plant tissue culture 4) sterilization of plant parts.

b. Biological safety cabinets will be inspected annually by contractors. Reports of biological safety cabinet inspections are filed at each site library for employee review.

3. Exhaust Trunks: Flexible exhaust trunks are available for some laboratory operations. Specifically, DB NRRC uses exhaust trunks in the instrument lab to remove excess heat or fumes released and in other labs when packaging and sorting seeds or other procedures which produce dust. These are to be placed as closely as possible over the process, and are to be arranged to prevent contaminants from entering the breathing zone of the operator.

4. Glove Boxes are not currently used at the **SPBL**.

D. Personal Protective Equipment

1. Personnel shall wear protective apparel that provides the required degree of protection for the substances handled. The CHO will advise employees on the use of gloves, gowns, aprons, eye protection, barrier creams, etc. Permeability charts are available from garment manufacturers.

2. Dust masks are provided for employees who want an added protection from certain particulates. Specifically: 1) at ASRU dust masks are worn for chemical and fertilizer application and lawn maintenance around ponds, 2) at DB NRRC dust masks are worn for grain thrashing in the field and grain grinding within the building, and 3) at HKD SNARC dust masks are worn for lawn maintenance around ponds.

E. Lab Coat Policy

1. Long sleeved and over the thigh.

2. Always worn when working with chemicals.

3. Not to be removed from the building, they are to be cleaned in the washer\dryer that is furnished at SNARC and DBNRCC. ASRU employees will need to check with their supervisors on the proper way of cleaning lab coats.

4. Not to be worn in public places (bathrooms, break rooms, meeting rooms, etc...).

F. Pipette Policy

1. No mouth pipetting is allowed under any circumstances.

2. Pipettes are to be thrown away in the glass or sharps containers, not in

the normal trash.

- G. Standard Operating Procedures (SOPs): SOPs are to be followed in the laboratory. These are general procedures of laboratory operation which help to protect the safety and health of personnel using chemicals, radioisotopes, or biological agents. When SOPs involving chemicals are written, they must include the cradle to grave process for the chemical\chemicals involved. This includes the disposal process for the chemical (drain, trash, hazardous waste, etc.). If the SOP indicates drain or trash for disposal – you must be able to prove why the chemical is no longer a hazard.

1. **SPBL's** SOPs are contained elsewhere in this Laboratory Safety Program.

- H. Chemical Spills – Each employee who works with chemicals in the lab has a responsibility to understand the hazards of the chemicals with which they work. Each RL should thoroughly review the information found on the MSDS for chemicals that they are using for the first time to determine the nature of the hazard, proper personal protective equipment (PPE), and the cleanup procedures for that chemical.

1. Containment – The first line of spill response is to always use devices and procedures to provide secondary containment to limit the spread of a spill. Carrying chemicals in a proper secondary container will help prevent breaking if dropped or at least maybe contain the chemical. Placing paper mats, foil, trays, or other devices in hoods and around balances before beginning operations, contains spills and expedites the cleanup. Refrigerators and freezers require secondary containment except on shelves containing only sample vials. Flammable and Corrosive cabinets in laboratory areas require secondary containment trays.
2. Spill Cleanup Equipment – located in or near areas where spills are likely to occur and are marked with signage. The general approaches used in cleaning a spill are chemical inactivation, absorption, or vacuuming and containing. The following will be available in the labs with these types of chemicals:
 - a. Acid spill cleanup kit – contains NEUTRASORB Acid Neutralizer along with an indicator dye to show when the acid has been properly neutralized.
 - b. Caustic spill cleanup kit – contains NEUTRACIT Caustic Neutralizer along with an indicator dye to show when the base has been properly neutralized.
 - c. Hydrofluoric Acid spill cleanup kit – contains the chemicals and supplies necessary for the neutralization and cleanup of HF.
 - d. Flammable Solvents spill cleanup kit – contains a proprietary

granular absorbent called “Solusorb”. This material contains the solvent vapor and limits evaporation.

- e. General Absorbents – absorbs spilled liquid chemical and stabilizes it for disposal. Absorbents are non-reactive, multipurpose and efficient.
- 3. Spills on surfaces – The most easily handled spills are the ones that consist of aqueous liquids of a household nature (water, coffee, etc.) on walking and working surfaces. These should be immediately cleaned by the responsible party as to prevent a serious injury from a slip or fall. Appendix 2.5 list suggested examples of hazard categories and the cleanup procedures.
 - 4. Spills on Employees – The employee’s response to a spill on the PPE, personal clothing, or on the skin should be dealt with by the nature of the agent that is spilled. It is expected that employees have consulted the MSDS and other information sources prior to working with a compound so they have an understanding of the hazard of the chemical with which they are working. Many of the common chemicals used in our labs such as methanol, acetone, isopropanol, or dilute acids or bases present a limited hazard to the employee. Limited contact with Category I and II type chemicals should not present a significant hazard as long as they are washed off immediately and contaminated clothing is removed and washed. Spills of these types of compounds of only a few milliliters probably do not require supervisor notification. Larger spills of a few hundred milliliters or more should be reported.
 - a. The main exception to this policy is when a liquid comes into contact with the eyes, even small quantities and of Category I or II chemicals can cause damage. These types of spills should be immediately drenched with water at an eye wash and a supervisor should be notified of the incident.
 - b. Very large volumes of chemicals spilled on a person or spills of highly toxic reagents, standards, or concentrated acids or bases are also a very serious matter and should be reported to a supervisor as soon as the incident is controlled. PPE that becomes contaminated must be removed as soon as possible. Contaminated personal clothing must also be removed. Employees should be placed in a drench shower as soon as possible and the CDSO and supervisor notified to determine further action. While this response to one of these incidents may seem embarrassing at the time, proper action is necessary to prevent permanent injury or death. The incident will be recorded and a description of the incident provided to the health care provider.

I. Gas Cylinders

1. Know the contents of a cylinder before making any connections. Always use a regulator or a pre-set pressure controller specifically designed for the gas being used. Protect the valves of pressurized gas cylinders. Damage to the valve could result in the cylinder becoming a “destructive rocket”. The caps should be left on gas cylinders during transportation and when not in use. Never strike a cap with a metal object. This could cause sparks and may result in a serious fire or explosion.
2. Keep unnecessary combustible materials out of work areas. If gas cylinders are used in work areas, limit the number of cylinders to those actually required. Leased cylinders must be returned to their owners when finished using.
3. Check for appropriate warning devices and signs to preclude accidental entry or dangerous acts. (DANGER-HYDROGEN, NO SMOKING, FLAMMABLE GASES, ETC.). Gas shutoff valves should be clearly labeled and ensure that access to them is never impeded.
4. Take special care if a leaking cylinder is discovered. These leaks usually occur at the valve or pressure relief device. If the gas has not ignited, use a gas cart to carefully move the cylinder to a safe area outside of the building and contact your supervisor immediately. If there is a serious leak or the gas has ignited (a hydrogen flame is virtually invisible), call the Fire Department immediately. Evacuate all personnel. Do not re-enter the area. Do not try to suppress the flame but do try to shut off the hydrogen supply if it is outside of the work area. If the flame is extinguished without shutting off the gas source there is danger of explosive re-ignition.
5. Gas cylinders are purchased as needed so there is no storage area for full or empty cylinders. Make sure to clearly mark empty cylinders.
6. Gas cylinders are to be chained at all times to protect against accidental falling.
7. Lecture bottles are small cylinders containing small amounts of toxic gases. These cylinders are easy to carry and do not require a gas cart to move. However, these cylinders provide a unique risk because they can easily be dropped and damaged. These cylinders must also be anchored to prevent tipping over and damage.

J. Medical Consultation and Examination

1. Under the Occupational Medical Surveillance Program (OMSP), **SPBL** provides medical baseline monitoring and medical examinations to exposed employees through the OMSP contractor (Stuttgart Regional Medical Center, N. Buerkle Road [P.O. Box 1905], Stuttgart, AR 72160). Additional medical attention, including follow-up examinations shall be provided under the following circumstances:

- a. When an employee develops signs and symptoms associated with a hazardous chemical to which they may have been exposed.
 - b. When an event takes place in the work area, such as a spill, leak, explosion, or other occurrence resulting in the likelihood of a hazardous exposure.
 - c. Where exposure monitoring reveals an exposure level routinely above the OSHA action level or, in the absence of an action level, exposure above the OSHA permissible exposure level (PEL). For OSHA regulated substances for which there are medical monitoring and medical surveillance requirements, medical surveillance shall be established for that employee. OSHA PELs can be found in OSHA Publication 3112, *Air Contaminants - Permissible Exposure Limits*, 1989 (reprint), a copy of which is available at the DB NRRC library (or see Tables Z1, Z2, and Z3 at <http://www.osha-slc.gov/SLTC/pel/index.html>).
2. The employee shall contact the CDSO or LAO to initiate the medical program. All medical examinations and consultations under the Chemical Hygiene Program are provided by the OMSP contractor (Stuttgart Regional Medical Center, N. Buerkle Road [P.O. Box 1905], Stuttgart, AR 72160). All aspects of these examinations are provided without cost to the employee, without loss of pay, and at a reasonable time.
- a. The CDSO, CHO, or the responsible supervisor will provide the following to the physician:
 - ◆ Identity of the hazardous chemical to which the employee may have been exposed.
 - ◆ Description of the conditions of the exposure including exposure date if available.
 - ◆ Description of signs and symptoms of exposure that the employee is experiencing (if any).
 - b. The consulting physician will provide:
 - ◆ Results of examination and associated tests.
 - ◆ Recommendations for future medical follow-up.
 - ◆ Any medical condition revealed which may place the employee at increased risk as the result of a chemical exposure.

- ◆ A statement that the employee has been informed by the physician of the results of the examination/ consultation and told of any medical conditions they may require additional examination or treatment.
 - ◆ The information returned by physician shall not include specific findings and diagnoses which are unrelated to occupational exposure.
3. If the medical examination indicates a possible work-related injury or illness, the employee may elect to file a workers compensation claim.
 - a. If a workers compensation claim is filed, the employee may select any doctor or clinic for treatment.
 - b. Questions about the workers compensation program may be directed to the Personnel Specialist at the Area Administrative Office, 979-260-9443.

K. Prior Approval for Specific Laboratory Procedures

1. Certain laboratory procedures that present a serious chemical hazard requires prior approval before work can begin. These procedures include work with selected carcinogens, reproductive hazards, neurotoxins, or other acutely hazardous chemicals. Physical hazards as well as the health hazards are to be considered in this determination.
2. When designing new experiments or operations with these classes of materials, personnel should notify their Research Leader and the CDSO/CHO to determine what special procedures or approvals are necessary.
3. When any of the above agents are used at ASRU, DB NRRC or HKD SNARC, written procedures for their use shall be added to the Chemical Hygiene Plan. The procedures shall include, as appropriate, establishment of designated work areas, use of containment devices such as fume hoods or glove boxes, procedures for safe removal of contaminated waste, and decontamination procedures.
4. Any questions or concerns related to work with potential carcinogens should be directed to the CHO.
5. Work with radioisotopes will be done in accordance with the USDA Radioactive Materials License and with guidelines promulgated by the Department, Agency, Nuclear Regulatory Commission. Employees working with radioisotopes should consult the **SPBL** Radiation Protection Plan. Any questions or concerns in this area should be directed to the **SPBL** Radiation Protection Officer.

L. Children in the Chemical Labs:

1. No children under the age of 16 are allowed in the chemical labs. The only exception to this policy will be for special occasions such as, bring your daughter to work day and job mentoring\shadowing and only with direct and continuous supervision.

XI. EMERGENCY PREPAREDNESS

- A. Fire Extinguishers will be serviced annually by a licensed vendor. Monthly inspections will be conducted by the Facility Manager or other designated official. Reports of fire extinguisher inspection are filed at each site library and with the CDSO for employee review.
- B. First Aid Kits
1. Kits are located at ASRU (feed building, all vehicles), DB NRRC (hallways near labs, all vehicles) and HKD SNARC (central mail room, wet lab, maintenance building, bird depredation necropsy room, all vehicles).
 2. Kits will be inspected annually by the Facility Manager or other designated official. Reports of first aid kit inspections are filed at each site library and with the CDSO for employee review.
- C. Safety Showers and Eyewash Stations
1. Safety showers and eyewash stations shall be located within 30 meters (100 feet) or 10 seconds travel time to chemical operations. Ref.: ARS Manual 242.1, *Construction Project Design Standard*.
 2. They will be inspected annually by the CDSO to verify proper flow of water. Reports of inspections are filed at each site library for employee review.
- D. Spill kits, appropriate for the chemicals being used, will be available.

XII. TRAINING

- A. Employees covered by the chemical hygiene standard will be provided with information and training so that they are acquainted with the hazards of chemicals in their work area. The supervisor will train the employee as soon after the time of initial assignment as practicable and prior to new assignments involving different exposure situations. Refresher training will be given annually or as needed. The training/information sessions shall include:
1. Viewing of all relevant training videos.
 2. Completion of any relevant training software.
 3. The contents of 29 CFR 1910.1450 and its appendices. These are

available to employees at the DB NRRC library.

4. The availability and location of the written Chemical Hygiene Plan.
 5. Information on OSHA permissible exposure limits (PELs), where they exist, and other recommended exposure limits.
 6. Signs and symptoms associated with exposure to hazardous chemicals in the laboratories.
 7. Location of reference materials, including MSDSs, received on the safe handling of chemicals in the laboratories. Methods to detect the presence or release of chemicals (i.e. monitoring, odor thresholds, etc.).
 8. The physical and health hazards of chemicals in laboratory work areas.
 9. Measures to protect employees from these hazards, including:
 - a. SOPs
 - b. Work practices
 - c. Emergency procedures
 - d. Personal protective equipment
 10. Location and use of spill kits, eye-wash stations, and safety showers.
 11. Use of fire extinguishers and other fire protection systems.
- B. The supervisor, in conjunction with the CDSO, is responsible for conducting training sessions. Refer to Appendix 2.6 for an outline of **SPBL**'s training program.
- C. Each employee will sign a form documenting that they received training.
- D. The RLS, with the assistance of the CDSO, are responsible for developing standard operating procedures and for developing training on SOPs. These SOPs and training procedures will be filed with the CDSO.

XIII. INSPECTION/REVIEW PROGRAM

- A. Each year, the Chemical Hygiene Program will be reviewed to determine its adequacy and whether changes, updates, or improvements are needed.
- B. Facility inspections will be performed at least annually to verify that engineering controls, SOPs, workplace contaminant monitoring, and medical consultations are effective in preventing employee exposure to chemicals.
- C. A copy of the inspection and review will be given to the Location Coordinator

for correction of any discovered inadequacies or noncompliance.

- D. A copy of the annual inspection and review will be kept at each site library for employee review.

XIV. RECORD KEEPING AND REPORTING

- A. The following records will be kept:
 - 1. Program activities.
 - 2. Annual inspections and program reviews.
- B. Records will be kept in each site library for employee review.
- C. The employee will have an accurate record of any measurements taken to monitor employee exposures, any medical consultation, and examinations.
- D. Exposure monitoring data will be kept 30 years past employee's employment. The LAO will retain these records.
- E. Medical records (only records that don't violate the HIPPA regulations) are maintained by the LAO for 5 years.
- F. Training attendance. The location's training records are maintained by the CDSO for an undetermined amount of time.

Appendix 2.1

List of chemicals meeting\exceeding the threshold of SARA Title III\CERCLA requirements

NONE

Appendix 2.2 - List of chemicals below the threshold of SARA Title III/CERCLA requirements

DB NRRC

<u>RCRA #</u>	<u>CAS #</u>	<u>Chemical Name</u>	<u>Amount on Hand</u>	<u>Location</u>	<u>TPQ</u>	<u>Hazard</u>
U007	79-06-1	Acrylamide		L2	1000	
	7773-06-0	Ammonium sulfamate	100g	L21	5000	
U012	62-53-3	Aniline		L12&L5	1000	Toxic
P022	75-15-0	Carbon disulfide	500ml	L21	10000	
U044	67-66-3	Chloroform		L11	10000	Toxic
	67-66-3	Chloroform	1L	L21	10000	
	67-66-3	Chloroform	1L	L21	10000	
	67-66-3	Chloroform		L12&L5	10000	Flammable
	67-66-3	Chloroform	500g	L1	10000	
	67-66-3	Chloroform		L2	10000	
	64-86-8	Colchicine		L12&L5	10	Poison
U246	506-68-3	Cyanogens bromide		L18	500	
U122	50-00-0	Formaldehyde		L11	500	Caution-harmful
	50-00-0	Formaldehyde		L2	500	
	50-00-0	Formaldehyde		L11	500	Irritant, eyes and skin
	50-00-0	Formaldehyde		L12&L5	500	Flammable
	7722-84-1	Hydrogen peroxide		L12&L5	1000	Oxidizing, corrosive
	7697-37-2	Nitric acid		L18	1000	Corrosive
	7697-37-2	Nitric acid		L2	1000	
U188	108-95-2	Phenol		L11	500	Toxic, flammable
	108-95-2	Phenol		L12&L5	500	Toxic
P105	26628-22-8	Sodium azide		L18	500	Toxic

SNARC

<u>RCRA #</u>	<u>CAS #</u>	<u>Chemical Name</u>	<u>Amount on Hand</u>	<u>Location</u>	<u>TPQ</u>	<u>Hazard</u>
U007		Acrylamide-Bisacrylamide	100ml	Rm 116	1000	
U012		Aniline	4L	Rm 116	1000	
		Boron Trifluoride, BF3	500ml	Jacobs	500	
P022	75-15-0	Carbon disulfide	500ml	Rm 128	10000	
		Chloroform	24L	Jacobs	10000	
U044		Chloroform:Isoamyl alcohol	1 pt	Rm 116	10000	
		Ethylenediamine-Tetraacetic Acid (EDTA)	600g	Rm 128	10000	
U122		Formaldehyde	500ml	Rm 116	500	
U122		Formaldehyde	3500ml	Mitchell	500	
		Hydrogen Peroxide	500ml	Rm 116	1000	
		Hydrogen Peroxide	500ml	Straus	1000	
		Hydrogen Peroxide	500ml	Mitchell	1000	
		Nitric Acid	15L	Rm 128	1000	
		Nitric Acid	50ml	Mitchell	1000	
		Nitric Acid, HN03	4L	Jacobs	1000	
		Phenol	150g	Jacobs	500	
U188		Phenol:Chloroform:Isoamyl alcohol 25:24:1	100 ml	Rm 116	500	
		Sodium Azide	100g	Rm 126	500	
		Sulfuric Acid	3000ml	Rm 128	1000	
		Sulfuric Acid	500ml	Rm 126	1000	
		Sulfuric Acid	500g	Straus	1000	
		Sulfuric Acid	700ml	Mitchell	1000	
		Sulfuric Acid	2100ml	Ludwig	1000	

ASRU

<u>RCRA #</u>	<u>CAS #</u>	<u>Chemical Name</u>	<u>Amount on Hand</u>	<u>Location</u>	<u>TPO</u>	<u>Hazard</u>
U044	67-66-3	Chloroform	6L	Lab Trailer	10000	Toxic
		Hydrogen Peroxide	1L	LabTrailer	1000	
		Sulfuric Acid	500ml	LabTrailer	1000	

Appendix 2.3

Appendix A TO 40CFR PART 355 - the List of Extremely Hazardous Substances and Their Threshold Planning Quantities

The list is too long to append to the plan. You can view the list at the following website:

<http://dep.state.ct.us/wst/serc/hazsub.htm>

Appendix 2.4

Alphabetical Order List of Extremely Hazardous Substances (Section 302 of EPCRA)

The list is too long to append to the plan. You can view the list at the following website:

<http://www.scdhec.gov/eqc/baq/pubs/ehsalpha.pdf>

Appendix 2.5

Suggested Examples of Hazard Categories Based on Quantity and Toxicity of the Compound	
<p>Category I</p> <ul style="list-style-type: none"> • Coffee, water in any volume • Most analytical chemicals in microliter quantities • Isopropyl alcohol • Ion chromatograph mobile phase • Liquid chromatograph mobile phase with >50% water 	<p>Cleanup process</p> <ul style="list-style-type: none"> • Blot with paper towels or Kimwipes until dry • Contact maintenance if assistance is needed • Do not need to notify supervisor
<p>Category II</p> <ul style="list-style-type: none"> • About 2.5 to 4 liters of most common solvents (methanol, acetone, naphtha) • 1 liter of acetonitrile • 2.5 liters of sulfuric and nitric Acids • 2 to 4 liters of dilute mixtures of acid or base 	<p>Cleanup process</p> <ul style="list-style-type: none"> • Notify other personnel in the area to stay clear • If you are not comfortable cleaning up alone, contact your supervisor immediately • Determine the chemical involved and how much was spilled. If necessary, review the MSDS for PPE to be worn, and cleanup and disposal procedures. • Identify and locate the supplies needed for cleanup and disposal. • Clean up and package for disposal in appropriate containers. This generally consists of placing the contaminated material in a plastic bag and sealing, followed by placement in another plastic bag and sealing (double bagging) • Consult with the supervisor about proper storage and disposal.
<p>Category III</p> <ul style="list-style-type: none"> • Pure standards • Beryllium oxide powder • Concentrated HCl, HF • Arsenic, cyanide, mercury 	<p>Cleanup process</p> <ul style="list-style-type: none"> • Keep the fume hoods on, leave the room, and close the door • Notify other personnel in the area to stay clear • Contact supervisor • Determine the chemical involved and how much was spilled. If necessary, review the MSDS for PPE to be worn, and cleanup and disposal procedures. • Identify and locate the supplies needed for cleanup and disposal or call the fire department or hazardous waste cleanup facility for cleanup if the spill is too large or hazardous • If possible, clean up and package for disposal in appropriate containers. This generally consists of placing the contaminated material in a plastic bag and sealing, followed by placement in another plastic bag and sealing (double bagging) • Consult with the supervisor about proper storage and disposal. • Prepare detailed report documenting the accident and send to the CDSO • Post cleanup sampling if the spill was large or very hazardous.

<p>Category IV</p> <ul style="list-style-type: none"> • Solutions of carcinogens, pesticides, beryllium oxide, arsenic, cyanide – usually 25 mL or less of a solution used as an analytical standard • Small bottles of neat standards – 50 to 100 mL 	<p>Cleanup process</p> <ul style="list-style-type: none"> • Keep the fume hoods on, leave the room, and close the door • Evacuate all personnel in the area • Contact supervisor immediately • Determine the chemical involved and how much was spilled. • Call the fire department or hazardous waste cleanup facility for cleanup. • Prepare detailed report documenting the accident and send to the CDSO • Accident carefully analyzed and reports distributed to CDSO • Post cleanup sampling if the spill was large or very hazardous. • Monitoring needs to establish that cleanup has been completed.
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Appendix 2.6

SPBL SAFETY TRAINING REQUIREMENTS	JOB CATEGORIES							
	Administrative & Management Personnel	Laboratory Personnel	Laboratory Supervisors	Maintenance & Janitorial – DBNRRC	Maintenance & Janitorial – SNARC	Field Workers – DBNRRC	Field Workers – SNARC & ASRU	Assigned by Supervisor or Voluntary
Asbestos Awareness (Online) Initial					X			
Asbestos Awareness (Video) Initial					X			
Bloodborne Pathogens (Online) Initial & Annual				X	X			
Confined Space (Online) Initial & Before Entry				X	X			
Ergonomics (Online) Initial	X							
Slip & Fall Protection (Online) Initial	X	X	X	X	X	X	X	
Fire Extinguisher (Online) Initial & Annual	X	X	X	X	X	X	X	
Forklift Safety (Online) Initial & As Necessary				X	X			
Hazard Communication\MSDS (Online) Initial & Ongoing		X		X	X	X	X	
Lockout\Tagout (Online) Initial & As Necessary				X	X			
Personal Protective Equipment (Online) Initial & As Necessary		X	X	X	X	X	X	
Compressed Gas Cylinders (Online) Initial & As Necessary		X	X					
Electrical Safety (Online) Initial & As Necessary				X	X			
AED (Online) Initial & As Necessary								X
Safety Orientation\Emergency Procedures (Manual) Initial	X	X	X	X	X	X	X	
Mower Safety (Online) Initial & As Necessary				X	X			
Sun Safety (Online) Initial				X	X	X	X	
Ag Machinery (Online) Initial						X	X	
Handling Pesticides (Online) Initial & Annual						X		
Basic First Aid (Online) Initial	X	X	X	X	X	X	X	
HazCom for Supervisors (Online) Initial & Annual			X					
Back Injury Prevention (Online) Initial & As Necessary		X		X	X	X	X	
Liquid Nitrogen (Powerpoint) Initial & As Necessary								X
Gator Safety (Video) Initial						X	X	
Fish Farm Safety (Video) Initial					X		X	
AutoClave (Powerpoint) Initial								X
Practicing Safe Science (Online) Initial & As Necessary		X	X					
OR								
Practicing Safe Science (Video) Initial & As Necessary		X	X					